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LOMA LINDA UNIVERSITY
School of Science and Technology
in conjunction with the
Department of Psychology

The Relationship between Personality and Music Preference

by

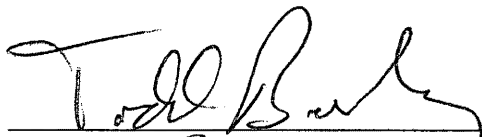
Robert K. Hull

Project/Thesis submitted in partial satisfaction of
the requirements for the degree of
Doctor of Psychology

December 2009

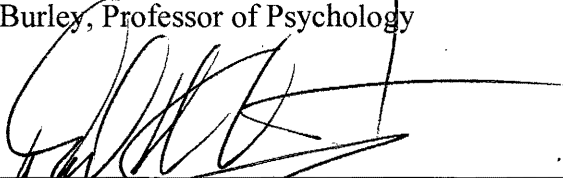
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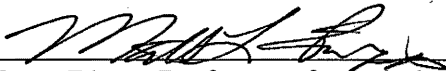


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DEDICATION

I would like to express my deepest gratitude to Dr. Todd Burley who provided me with guidance and allowed creative autonomy. He provided support and patience, along with support for using the subject of music as an endeavor to research. Dr. Burley, thank you for all of your time, energy, and effort that you have invested in me.

I would also like to thank my committee members for their advice and direction, as well as their patience. Dr. Matt Riggs, thank you for your expectations and your knowledge of the statistical process that you instilled in me from day one. Dr. David Chavez, thank you for your knowledge, experience, and expectations as well, which aided me in determining the value of my project.

I would like to give special thanks and dedicate this project to my mother, Brenda Hull, and to my father, Norman Hull, Sr. My mother and father supported my academic career and emphasized the importance of it since I was in grade school. Thank you for that and thank you for all the sacrifices you went through with having four children. Finally, I would also like to dedicate this work to my wife, Debora Hull. You have been my rock and support through all of this. You never faltered in maintaining your faith in me even when I had none for myself. This project is for you. I love you.

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ABSTRACT

The Relationship between Personality and Music Preference

by

Robert Hull

Doctor of Psychology, Graduate Program in Psychology
Loma Linda University, December 2009
Dr. Todd Burley, Chairperson

Music is an “ubiquitous and social phenomena” (Rentfrow & Gosling, 2003) and as such it deserves attention at the experimental level. It has been used as a tool in many areas of the health care system such as assessment, treatment, rehabilitation and follow-up care (Memory & Bellamy, 1993). It has also been used as a tool in medical research to determine how it affects one’s physiology (Morhinweg, 1992). Recently, music has been used in the field of psychology and personality (Dollinger, 1993). More specifically, it was found that using music as a tool in the psychology field can aid in the understanding of personality. Research has shown that certain types of music (Jazz, Rhythm and Blues, and Rock) may be related to specific personality traits and behaviors. This study asked the question “Is there a significant difference in degrees of a groups level of Openness and Agreeableness associated with the type of music one listens to?” In this study it was hypothesized that:

1. Those who prefer to listen to Jazz and Rhythm and Blues music have higher scores of Openness and Agreeableness on the NEO Personality Inventory-Revised (NEO-PI-R) than those who prefer to listen to Alternative, Country and Western, Hip-Hop/Rap, or Rock music. It was expected that there was a positive correlation with the scores of those preferring jazz/rhythm and blues with scores of Openness and Agreeableness.

2. Those who prefer more than one style of music have a higher degree of Openness and Agreeableness on the NEO-PI-R than those who prefer to listen to only one style of music regardless of whether it is Alternative, Country and Western, Hip-Hop/Rap, Jazz, Rhythm and Blues, or Rock music. It was expected that there was a positive correlation with those who listen to more than one style of music with the degree of Openness and Agreeableness.

It was found that there was no significant correlation with music listeners of any music style with the scores of Agreeableness. It was also found that the group with a preference to Classical and Techno music had stronger positive correlation with the Openness scale than groups with a preference for Jazz and Rhythm and Blues music. It was also found that the group with a preference for Country music had a negative correlation on the Openness scale, and the group with a preference for Hip-Hop/Rap music correlated negatively with Agreeableness. It was also found that the more music styles groups preferred, the more open to experience they were.

Introduction

Music is part of everyday human existence. While it may seem merely a form of entertainment, music can be useful in many areas. Music can be useful in understanding and investigating psychological issues. Studying personality traits and adding music preference to the research can help researchers and the public to be aware of this important element to peoples' everyday lives. Including elements of everyday life in psychological research can bring awareness to psychology that is typically not used in mainstream research. Using music as a factor in psychological research can also interest others to broaden the typical research focus that uses everyday factors rather than focusing on the abnormal or the unordinary. Using music and the findings of music preference tied with psychological traits regardless of the findings adds to the information regarding social behaviors. Using music, an everyday element of social behavior, can aid in the research that generalizes to the general public as music is something that is a large part of people lives as well as social behavior. It is hoped that the research findings can also aid in understanding the social/psychological aspects. Professionals in the fields of medicine and psychology use music as a tool and technique in health care. Music is used for therapy, personality assessment, and rehabilitation. Raymond Cattell once remarked "So powerful is the effect of music...that one is surprised to find in the history of psychology and psychotherapy so little experimental, or even speculative, reference to the use of music." (Cattell, 1954).

Music has played a part in medical and psychological research but little research has been conducted about the preference of music. More specifically, how does one's preference of music relate to one's personality? It is reported that music is used as a way

to communicate one's attitudes, beliefs, and values (Rentfrow & Gosling, 2003). Other studies (Rawlings & Ciancarelli, 1997) seem to point to a relationship between personality and music preference as well. Cattell (1954) examined music preferences almost 50 years ago and it appeared that there were strong preferences for distinct personalities to like certain types of music. Therefore, this study will review the literature on the use of music in the areas of medicine, psychology, therapy, interventions, as well as explore the relational aspects of music and personality.

The research was guided by two hypotheses: (1) Will those who prefer to listen to jazz and rhythm and blues music have higher scores of Openness and Agreeableness on the NEO-PI-R than those who prefer to listen to alternative, country and western, hip-hop/rap, or rock music? (2) Will those who prefer more than one style of music have a higher degree of Openness and Agreeableness on the NEO-PI-R than those who prefer to listen to only one style of music regardless of whether it is alternative, country and western, hip-hop/rap, jazz, rhythm and blues, or rock music?

Music Therapy

Though music is a part of entertainment in everyday life, it has also been used in therapy for at least four decades (Gregory, 2002). Early information consisted of anecdotal accounts from practitioners and educators during the time that behavioral psychology was being developed and becoming a powerful influence. Many music therapy research projects were adaptations from behavioral designs, and many of these designs focused on the comparisons of effects of non-contingent background music, and no music on non-music behaviors.

There are several theories on how music therapy works. Music may be a competing stimuli that can distract patients from perceptions of pain or anxiety, elicit relaxation responses, and listening to music may decrease arousal of the central nervous system (Gagner-Tjellesen, Yurkovich, & Gragert, 2001). Music has also been linked to alpha waves in the brain that may produce endorphins that reduce pain and can reduce blood pressure and heart rate.

Music has also been instrumental in facilitating the health of children. When children experience a long hospitalization, the illness, injury, hospital environment, and various operations and procedures can negatively affect a child's growth and development (Kennelly, 2000). Music is an enjoyable stimulus for children and they have a particular responsiveness to it. A music therapist, who is trained in music, music therapy, psychology, sociology, and biology (Memory & Bellamy, 1993), uses music to engage children and then stimulate and encourage development skills. The elements of rhythm, melody, timbre, and other dynamics of music listening and playing can create change in the physiologic, psychological, and emotional components in a child's growth patterns. A music therapist prepares, conducts, and evaluates a program and implements it based on a child's needs. Occupational therapists, speech pathologists, and physiotherapists are consulted regarding the assessment information to identify ways that a music therapy program can support or enhance a child's development. For example, singing and playing a musical instrument can help a child with gross and fine motor skills. Singing familiar songs encourages vocalizations, verbalizations, and oral stimulation. Rewriting lyrics to a familiar song supports social and interactive therapy goals as well as creating good talking tips.

There are many applications of music therapy used by the therapist. These applications include stress reduction, pain management, oncology, gerontology, pediatrics and child-life programs, neonatology, and medical problems with musicians (Memory & Bellamy, 1993).

Music in Medical Settings

Music has been used as part of the healing process for rehabilitation and other medical uses including assessment, treatment, and follow-up care (Memory & Bellamy, 1993). For example, Healing Songs Therapy is used to help rehabilitate patients through the playing of instruments. The main goals of musical therapy are to activate feelings through musical stimulation, encourage expression, and improve physical health (Hamer, 1991). Songs can be used as tools for self-expression and can help increase a patient's or client's self-confidence in communication. Music has been used in the surgery room and in the surgical recovery of patients. The most prevalent use of music has been used for relaxation (Hamer, 1991).

Music may positively impact patients' heart rate, blood pressure, respiratory rate, oxygen saturation, skin temperature, and pain. Gail Mornhinweg (1992) reported that after listening to classical music, heart rates of subjects went from a pre-music range of 60 to 88 beats per minute to a post-music range of 56 to 84 beats per minute. Listening to popular music increased heart ranges from 62 to 90 beats per minute with a mean of 74 to a post-music range of 64 to 92 beats per minute with a mean of 76. In studies of self-reported pain, significantly lower scores were reported for patients who listened to music (Covington & Crosby, 1997). Listening to music during ophthalmic surgery was found to reduce blood pressure, heart rate, and perceived stress in older patients (Allen, 2001).

Elderly patients continued their prescribed exercise program better when accompanied by music than without music. (Johnson, Otto, & Clair, 2001). People who exercised with music minimized their coronary heart disease and improved their cardiovascular fitness, strength, flexibility, and mental achievement. Movements performed with music seemed to cue pacing that encouraged fluid and full-range movements. Movements without music were not as fluid.

Music can also aid those who suffer from Parkinson's Disease. Compressed, clenched, jerking movements can be relieved by music. The music must suit the individual's taste to offer help, suggesting that the patient must be actively listening to the music and that listening to music is an active process (Jourdian, 1998).

Music in Psychological Settings

Music as part of psychological therapy as well as in traditional medicine has shown positive effects in that clients relish or become elated when offered the chance to bring music that moves them into therapy (Nelson & Weathers, 1998). When clients bring their favorite music to therapy, they and their therapists can more easily make connections and see improvements. Lyrics can be created from inner feelings and put to music in the therapy process session.

Music in the psychiatric setting can be used to modulate mood, increase socialization and communication, and enhance relaxation and stress management (Covington, 2001). Music can also aid in limiting destructive behavior in the psychiatric inpatient setting. In a study conducted by Rawlings, Hodge, Sherr, and Dempsey (1995), music of a relaxing quality was played in the dining area of a psychiatric ward. Disruptive patients who suffered from mental disorders such as schizophrenia and who

usually dined in separate areas were allowed to eat in the dining area relegated to the non-disruptive patients. Relaxing music was played and the number of usual disruptive behaviors such as patients throwing plates and breaking windows dropped dramatically. Disruptive behavior rose when music was discontinued. When music was reinstated, disruptive behavior again dropped significantly.

In another study, 15 adult psychiatric patients with schizophrenia, 15 with unipolar depression and 15 control participants were compared for significant differences with music therapy (Pavlicevic & Trevarthen, 1989). Each participant took part in an individual music therapy session. For schizophrenic patients communication with the therapist was not established. They were unresponsive. Depressed patients were able to enter responsive musical communication with the therapist. Schizophrenic patients were not able to improvise with musical instruments while the depressed patients were able to, including exchanging tempo and decibel level. The control group was similar to the depressed group; however, they took more musical initiative and were able to enter a fully mutual musical partnership with the therapist.

Covington (2001) states that music can provide a medium for individuals to evolve toward healing as they rhythmically interact with the environment. Individuals can also form new thoughts and feelings from music. Covington (2001) also explains the benefits of implementing music therapy in a psychiatric inpatient setting as increasing self-esteem, enhancing socialization/communication, expressing emotions, providing relaxation information, enhancing physical and emotional healing and identifying styles used for coping and self expression. This was determined by using an evaluation form that detailed information for type of music preferred, one's Openness to different kinds of

music, personal feelings on self-esteem, and other personal skills/emotions. A self-report on the usefulness of music therapy was also part of the evaluation. Tabulating the evaluations to find the effective strength of music therapy suggested that patients felt that music helped as a motivator, and as a way to reduce anxiety and physical and emotional pain.

Music is also effective in treating emotionally disturbed children and adolescents (Layman, Hussey, & Laing, 2002). Children referred to music therapy by treatment teams for music therapy intervention were assessed in behavioral skills, including play skills, attention to tasks, impulse control, attempting activities and eye contact. The majority of music used by Layman, Hussey, and Laing (2002) was live instrumentation such as piano, guitar and keyboards.

Music has also been used with positive effects on self-injurious behavior in those with severe mental disabilities. Susan Ford (1999) reports that after music interventions, researchers saw no changes in patients' rate of mouth scratching and head hitting, although there was a strong downward trend in patients' grinding their teeth after listening to music.

As with positive effects on decreasing self-injurious behaviors, music therapy has been used to improve mood states in those with neurological damage such as Multiple Sclerosis (MS), traumatic brain injury (TBI) and brain damage from stroke (Magee & Davidson, 2002). The Profile of Mood States (POMS-BI) questionnaire was given to those with the ailments mentioned to determine their mood. Mood spectra that were measured were "composed-anxious," "energetic-tired," and "agreeable-hostile." The patients participated in one musical therapy session per week over a period of two weeks.

Listening to music and playing music with instruments were part of the therapy. Sessions also included a “welcoming” musical activity of playing an instrument in an improvisational style with the therapist, and an “ending” musical activity of playing an already pre-composed song. Results of music therapy indicated that changes in mood were consistently in a positive direction, suggesting that music therapy intervention resulted in feelings that were more composed, energetic, and agreeable.

Other studies (Smith & Noon, 1998) attempted to investigate the effects of different types of music on mood. Thirteen different pieces of popular music including classical, jazz, easy-listening, and rock were used along with the Profile of Mood States Test which included categories such as tense, depressed, angry, fatigued, and vigorous. All musical pieces produced a change in mood, both positively and negatively. A positive mood change denotes a positive change in mood such as a positive change in “fatigue” would mean a decrease in feelings of fatigue and a positive increase in “vigor” would mean an increase in energy and cheerfulness.

In a study by Hillard (2001), young participants in bereavement groups who utilized music-based therapy showed significant reduction in grief symptoms and behavioral problems. Ruth Bright (1999) also researched the effects of music therapy on grief resolution and found that using music in therapy sessions was useful to those who had difficulty finding words to express emotions and had the added benefit of helping them to feel understood.

Music and children. Music also plays a prominent role on children’s television programming (McGuire, 2001). The intent of some children’s television programming is to help children remember verbal material through music. Children responded better and

seemed to enjoy vocal renditions of rock/pop and country songs rather than instrumental music. Research on music acquisition (Singer & Singer, 1993) has shown that viewing of children's television programming such as Barney & Friends and Sesame Street that utilizes songs may facilitate learning among young children.

While music was proved effective in the study by Laymen, Hussey, and Laing (2002), in the areas of increasing impulse control and staying on task, there are also studies by McIntyre & Cowell (1991) of emotionally disturbed adolescents that show no significant differences in the frequency of maladaptive behaviors when music is utilized in treatment (McIntyre & Cowell, 1991).

Music intervention. Music has also been used as an intervention (Amir, 1999). An intervention in music therapy is any initiative that the therapist takes within the therapeutic setting for the purpose of helping patients/clients with their decision making. It is an action coming out of musical expression for the purpose of making a change in the client-patient's inner being through changes in the music (harmonically, tonally, or rhythmically). As previously mentioned, music has been used as a technique or strategy that is used by health care workers to engage patients to reach specific objectives in treatment (Amir, 1999).

Music and personality traits. Researchers in the field of psychology have studied the relationship between music categories and personality traits (Rawlings et al., 1995). Dance, easy-listening, classical, and hard-rock music were rated and correlated with the Eysenck Personality Questionnaire-Revised that provides measures of psychoticism, extraversion, neuroticism, and social desirability scales with a Music Preference Scale. High psychotic patients tended to prefer "harder" music and harsher sounds. Low

psychotic patients preferred “softer” music and sounds that are more consonant. Results suggest that high psychotic patients may choose music that expresses the aggressive anti-social characteristics of psychoticism. In another study (Krumhansl, 1997) on emotion, students at Cornell University measured/judged by self report their emotions of sadness, fear, and tension after listening to classical musical excerpts of Albinoni, Alfvén, Barber, Holst, Mussorgsky, and Vivaldi. Listening to Albinoni and Barber produced the strongest emotions for sadness. The music of Holst and Mussorgsky was judged to be strongest for emotions of anxiousness, fearfulness, and surprise. Ratings of emotion over time also showed emotions were maintained suggesting that music may be a good stimulus for inducing and maintaining an emotion for an extended period of time.

Other studies (Daoussis & McKelvie, 1986) using the Eysenck Personality Inventory suggested that both introverts and extraverts chose and rated rock and roll music as their favorite style of music over light rock, hard rock, progressive rock, new wave, disco, and punk rock. In testing reading recall, it was found that extroverts studied with music more often than introverts did (50% versus 25% respectively) and were unaffected by its presence or absence, whereas introverts were impaired by music playing. This suggests that the effects of music on cognitive performance may be moderated by individual differences. Individual differences such as likes and dislikes of certain types of music have been studied by Cattell and Sanders (1954), who found that jazz and classical music were correlated to a sentimental, introspective but cheerful nature (Cattell & Saunders, 1954).

The enjoyment of listening to specific music types related to personality traits has also been investigated using the Tellegen Absorption Scale. The scale was developed as a

measure of Openness as a trait and has been used to assess the ability to integrate simultaneous experiences (Rhodes, David, & Combs, 1988). Participants in research utilizing the Tellegen Absorption Scale listened to eight selections of music that included classical, new age, rock music, and country music. The participants rated each excerpt on a scale from 1 for strongly disliked to 5 for strongly liked. The findings supported the suggestion that the trait of absorption (Openness) was strongest for classical music.

In a study by Glasgow, Cartier, and Wilson (1985) it was found that conservatives preferred familiar music to unfamiliar music more than liberals did. Van Eijck (2001) reported that individuals from higher socio-economic status groups tended to like a higher number of diverse musical genres than those of lower socio-economic status groups. Another study on music preference by Little and Zuckerman (1986) found that preference for liking several kinds of music correlated with sensation seeking.

Stephen Dollinger (1993) conducted research using the NEO Personality Inventory (a 181-item inventory that is well validated as a measure of five factors of personality that include Openness, Extraversion, Neuroticism, Agreeableness, and Conscientiousness) and a 30-item music preference survey. Degree of Openness was correlated with preference for the classical, jazz, and rhythm and blues styles of music. Openness also had the greatest number of correlations to music styles. This suggests that Openness to experience was positively related to enjoyment of a variety of different kinds of music, including less mainstream music. David Rawlings and Vera Ciancarelli (1997) also conducted research on music preference utilizing the NEO Personality Inventory-Revised and Little and Zuckerman's Music Preference scale. In respect to Openness, the

findings support findings by Dollinger (1993) in that open individuals show a preference for diverse musical styles.

Openness or open-mindedness itself suggests withholding judgement (Gluck, 1999) and a disposition that makes one motivated to check one's belief system (Bramall, 2000). The willingness to act this way requires an individual to accept that he or she may be in error in particular beliefs as well as principles, and be prepared to change those beliefs. Open-minded persons can be open-minded to almost everything, including concerns about a person's firm beliefs and opinions. (This can include the therapeutic process). Roccas (2002) also found that Openness correlated with self-direction and universal values. Robert McCrae and Paul T. Costa (Hogan, Johnson & Briggs, 1997) describe Openness as a basic dimension of personality. Appreciation of the trappings of culture such as literature, art, and music are factors that make up Openness. Having a wider range of experiences and conscientiousness are also factors of Openness. Broad experiences emotionally, cognitively, and perceptually structure Openness as well. There is a need for experience, which includes intellectual curiosity about the external world and the inner self. An active imagination and sensitivity also define Openness.

Personality traits such as Openness are also believed to influence perception. This perception can encompass perceptions of health as well. Personality characteristics were linked to symptom reporting, which can contribute to defining oneself as ill or healthy (Feldman, Cohen, Doyle, Skoner, & Gwaltney, 1999). Different personality traits were examined to see if there was a link between personality and illness perceptions. Participants in personality trait and illness research were exposed to a rhinovirus (RV) and monitored for five days for development of infection and for development of

symptoms of the common cold. Each day participants were queried if they had a cold and self reports were based on their own definition of illness. Those high in Openness to experience reported a larger number of cold symptoms than those who were lower in Openness to experience. In a study with geriatric patients (Jerram & Coleman, 1999), an assessment was conducted to determine if there was a relationship between personality traits and health behavior. The NEO Five Factor Inventory was given with questions assessing medical problems, perceived health status, positive health behaviors, and frequency of visits to general practitioners. It was found that Openness to experience and Agreeableness was associated with positive health perceptions.

In studies on personality and aesthetic preference, Openness to experience (Rawlings, 2000) was correlated to liking four major music types, many short music excerpts and eight categories of paintings. An “excitement seeking” sub-scale was associated with a liking for hard rock music/violent abstract art but contrasted with liking neutral-realistic art (over violent-abstract) and “easy-listening” music. Continued personality studies from Rawlings (1998) found that there was a significant relationship between sensation seeking, Openness, and psychoticism, and a creativity-preference set that was represented by preference for complexity and a dislike of soft popular music. A sub-scale also implicated a willingness of participants to question conventional values as a major part of the creative personality.

In other personality studies, Hansen and Hansen (1991) examined the relationship of popular music preferences to individual differences in social judgments and to personality characteristics. Participants who liked heavy metal were higher in Machiavellianism and machismo and lower in need for cognition than non-fans of heavy

metal music. They were also more cynical. Individuals who liked punk rock music were less accepting of authority than those who disliked punk rock. Another music preference study (McNamara & Ballard, 1999) suggested that arousing music was tied to sensation seeking.

Music studies by Savage (2006) examined musical tastes using a Cultural Capital and Social Exclusion survey. The research showed that musical taste was divided with a large number of people disliking certain genres of music as well as the existence of two distinct musical taste communities, one linking preference for rock, electronic, urban, world and heavy metal music, and the other group, preferring classical music and jazz. It was found that age, ethnicity, gender, education, and occupation class, were factors that influenced taste for musical genres.

Overview and Current Study

Music has been utilized in the health care field in many areas. The areas of medicine have shown that music affects the physiology of the body, and in psychology music can affect mood, emotions, and behavior. The next step would be using music as a predictor. More specifically, preference for music style can be used as a predictor.

Dollinger (1993), Rentfrow and Gosling (2003) and Rawlings and Ciancarelli (1997) have conducted studies that used a music preference questionnaire created by Little and Zuckerman and the Short Test of Music Preference (STOMP) matched with the NEO-Personality Inventory (NEO-PI) to determine if there were correlations between music preference and personality traits, specifically the Big Five personality traits of Openness and Extraversion. The NEO-PI, developed by Costa and McCrae (1992) measures five broad domains of personality traits (Openness, Extraversion, Neuroticism,

Agreeableness, and Conscientiousness) that are based on the Big Five factor theory of personality. The research by Dollinger (1993) found that there was a correlation between Openness and those with a preference for Classical, Jazz, and Rhythm and Blues music. Rentfrow and Gosling (2003), examined beliefs about music, the structure of music preferences, and the links between music preferences and personality. They found that preference for specific music dimensions (reflective and complex, intense and rebellious, upbeat and conventional, energetic and rhythmic) were related to personality dimensions such as Openness, political views, and cognitive abilities. Reviewing and replicating Rentfrow and Gosling research, Zweigenhaft (2008) found support for the former findings but also that Openness was the most robust trait that was correlated with music preference.

Replicating studies (Dollinger, 1993; Rentfrow & Gosling, 2003; Rawlings & Ciancarelli, 1997) with different populations as well as updating music categories used in these studies can help strengthen the validity and reliability of music measures (Music Apperception Scale), personality measures (this study uses the Revised NEO-PI) and provide further understanding in research of personality traits and music style preference that is lacking in research.

In this study it was hypothesized that:

1. Those who prefer to listen to jazz and rhythm and blues music have higher scores of Openness and Agreeableness on the NEO Personality Inventory-Revised (NEO-PI-R) than those who prefer to listen to alternative, country and western, hip-hop/rap, or rock music. It was expected that there was a positive correlation with the scores of those preferring jazz/rhythm and blues with scores of Openness and Agreeableness.

2. Those who prefer more than one style of music have a higher degree of Openness and Agreeableness on the NEO-PI-R than those who prefer to listen to only one style of music regardless of whether it is alternative, country and western, hip-hop/rap, jazz, rhythm and blues, or rock music. It was expected that there was a positive correlation with those who listen to more than one style of music with the degree of Openness and Agreeableness.

Methods

Participants

The sample was composed of 177 college students from California State University, San Bernardino. The sample was of sufficient size to provide adequate statistical power of .80 for correlations between the personality and music preference variables. Participants were students in introductory and upper division psychology classes during the spring 2007 semester. They volunteered to be in the study in exchange for 5 credits toward a course requirement. Each participant completed the Music Preference Scale. They then completed the Neo-PI-R. Data was collected regarding age, ethnicity, and gender. Coding was used on all data so no identifying information was collected by the researcher.

Measures

Music Preference Scale. This study utilized the Music Preference Scale (Little & Zuckerman, 1986; Rawlings & Ciancareli, 1997) to determine the music preference of participants in the study. The Music Preference Scale was developed by Patrick Little and Marvin Zuckerman (1986) from factor analyses of preference ratings for established categories of music based on divisions of the recording industry in the United States. Though there are no solid findings on the reliability and validity of this scale, it has been used in several studies regarding music and personality (Little & Zuckerman, 1986; Dollinger, 1993; Rawlings & Ciancarelli, 1997). The Music Preference Scale lists different music categories to assess what types of music an individual prefers to listen to. It also includes demographic items referring to age, gender, ethnicity, education, number

of hours a person listens to music weekly, what type of music one listens to weekly, and if one plays an instrument. It also incorporates 10 categories of music to assess what type of music one prefers to listen to. Subjects rate their preference level of music categories by using a 5-point likert scale (1 = dislike, 2 = indifferent, 3 = like slightly, 4 = like moderately, 5 = like very much). Music categories included in this scale include Alternative, Classical, Country & Western, Electronic, Jazz, Popular (Pop), Rock, and Soul/Rhythm and Blues. Several artists are listed as examples representing each category. Modifications of this measure were made by adding techno music to the category of the alternative description title. New music categories of Alternative/Techno and Hip-Hop/Rap music were also added as categories and current music artists for each music category were used as examples. The Music Apperception Scale was also updated by incorporating musical artists from the current years of 2000 until the present rather than from the 1970s to the 1980s.

This measure was used to determine and measure the independent variable, music preference (see Appendix A). The demographics that are included in the Music Preference Scale were analyzed with descriptive statistics for all groups. These were questions 1, 2, and 6, describing sex, age, and racial identity. Questions 17 to 52 that describes music genres were used to indicate basic preference level for music categories.

NEO-PI-R. The NEO-PI-R, developed by Costa and McCrae (1992), was used to assess a person's degree of Openness and Agreeableness. The NEO-PI-R measures five broad domains of personality traits based on the Big Five factor theory of personality. These domains are Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness. For each of the five domains, descriptions are given for different

ranges of scores. Items on the NEO-PI-R are based on a 5-point likert scale (strongly disagree, disagree, neutral, agree, strongly agree). A person's raw scores on each factor was converted to scaled T-Scores and put on a range where 0-34 is considered "very low," 35-44 is considered "low, 45-54 is considered to be "average," 55-64 is considered "high," and above 65 is considered to be "very high." One with a higher score on a specific subtest is assumed to have more of that characteristic than subscales with a lower score. This measure will be used to determine and measure the dependent variable, which are personality traits.

Normative data for the NEO-PI-R is based upon 526 college students and 983 adults. Internal consistency estimates range from .56 to .81 for the items that make up a domain, and from .86 to .92 for the domains. Test-retest reliabilities for the factors range from .86 to .91 over a six-month period. Over a six-year interval period, test-retest reliabilities exceed .80, representing considerable stability.

Procedure

College students in an introductory psychology class were asked to participate in the study. They were briefed on what the study involved (music preference related to personality traits). Participants were given an informed consent form (see Appendix B) and a packet that included a demographic questionnaire, the Music Preference Scale (see Appendix A), and the personality trait assessment instrument NEO-PI-R. A cover sheet explained the experiment and purpose of the study. Subjects completed the assessments at home and returned them to the instructor of the psychology class who then gave completed packets to the examiner at a later time. All assessment packets were randomly

numbered for anonymity. All participants were treated in accordance to the Ethical Principles of Psychologists and Code of Conduct.

Sample Size and Power Analysis

The criterion for significance (α) was set at 0.05. A moderate t effect size was expected using Cohens formula for effect size. The proposed sample of 177 has a power of 80%.

Data Analysis

For hypothesis 1, groups who listened to Jazz and Rhythm and Blues were expected to have higher Openness and Agreeableness scores compared to those who did not listen to jazz and rhythm and blues. The primary independent variable was those who had preferred a specific music style (having a music preference scale >2 for those categories) vs. those who did not prefer those musical styles (Alternative, Country and Western, Hip-Hop/Rap, Rock > 2) on the Music Apperception Scale. Each musical style served as an independent variable. Further analysis was completed using the other musical style as independent variables and two dependent variables, Agreeableness and Openness. Variables for each music style were created to perform independent sample t tests.

For hypothesis 2, the number of music groups that scored higher than 2 (“indifferent, neither like or dislike, not familiar with”) were tested using Pearsons Correlation where the variables were the number of types of music correlated to either Openness or Agreeableness. The number of musical styles liked was expected to correlate with Openness and Agreeableness. This entailed using a likert-scale for cut

points 1 (1 style), 2 (2 styles), 3 (>3 styles preferred). Scores for Agreeableness and Openness was expected to be very low (0-44), low (45-64), average (65-85), high (87-106), and very high (107-192). A moderate effect size was expected and significance assumed at an α of 0.05. The demographics that are included in the Music Preference Scale were analyzed with descriptive statistics for all groups. All data was analyzed using SPSS V.15 (SPSS INC. Chicago, IL.).

Results

Study Participants

This study recruited 177 participants older than 18 attending California State University, San Bernardino. There were 143 females and 34 males. 50 described themselves as Caucasian, 19 as Black, 72 as Hispanic, 13 as Asian, and other ethnicities. 13 subjects were excluded due to missing data from either the Music Apperception Scale or they did not fill out the NEO-PI-R correctly. The average age of the participants was 25. Table 1 contains this information.

Table 1

Demographics: The Total Participants, Their Average Age, and the Ethnic Breakdown

Variable		Mean \pm SD or Frequency (%)
Age		25.01 \pm 6.8
Gender	Female	143 (80.8%)
	Male	34 (19.2%)
Ethnicity	Caucasian	50 (28.2%)
	Black	19 (10.7%)
	Hispanic	72 (40.7%)
	Asian	13 (7.3%)
	Other	9 (5.1%)
	Missing	14 (7.9%)
Total	177	(100%)

NEO-PI-R Scores

The average Openness and Agreeableness NEO-PI-R scores were 120 (± 17.0 *SD*) and 116 (± 17.9 *SD*) respectively. Both NEO-PI-R scores of Openness and Agreeableness were normally distributed (see Figure 1 and Figure 2). The majority of people scored high to very high in both categories of Openness and Agreeableness (see Table 2).

Figure 1.

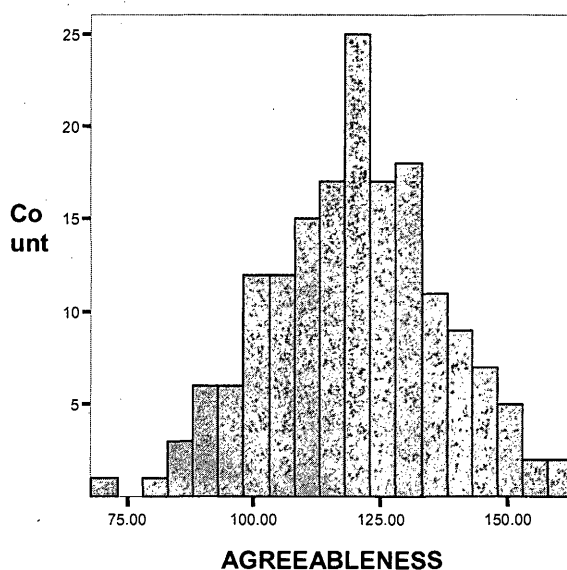


Figure 1. Number of people who scored between 0 and 192 on the NEO-PI-R Scale for Agreeableness.

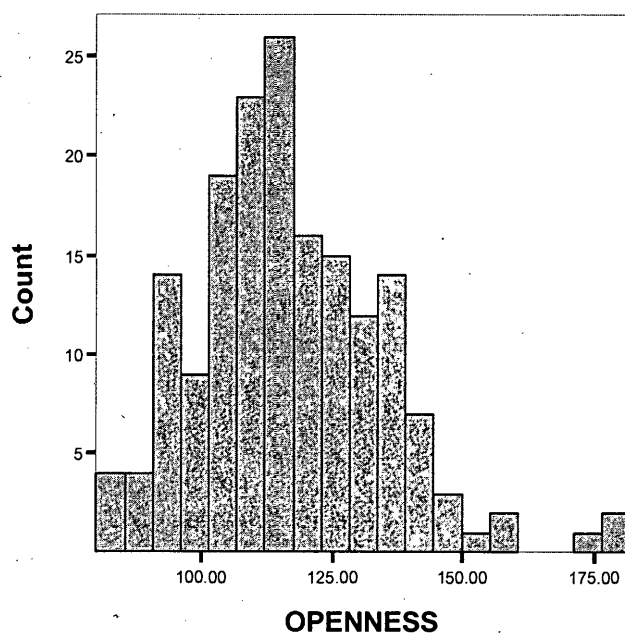


Figure 2. Number of people who scored between 0 and 192 on the NEO-PI-R Scale for Openness.

Table 2

Chi Square

	Agreeableness		P-value	Openness		P-value
	High	Very High		High	Very High	
Rock	29 (80.6%)	107 (80.5%)	0.989	39 (78.0%)	100 (82.0%)	0.549
Non-Rock	7 (19.4%)	26 (19.5%)		11 (22.0%)	22 (18.0%)	
Classical	20 (55.6%)	84 (63.2%)	0.406	26 (52.0%)	78 (63.9%)	0.146
Non-Classical	16 (44.4%)	49 (36.8%)		24 (48.0%)	44 (36.1%)	
Techno	14 (38.9%)	63 (47.4%)	0.365	17 (34.0%)	63 (51.6%)	0.035
Non-Techno	22 (61.1%)	70 (52.6%)		33 (66.0%)	59 (48.4%)	
Alternative	23 (63.9%)	85 (63.9%)	0.998	26 (52.0%)	83 (68.0%)	0.048
Non-Alternative	13 (36.1%)	48 (36.1%)		24 (48.0%)	39 (32.0%)	
Top 40	26 (72.2%)	106 (79.7%)	0.336	39 (78.0%)	97 (79.5%)	0.825
Non-Top 40	10 (27.8%)	27 (20.3%)		11 (22.0%)	25 (20.5%)	
Country	18 (50.0%)	74 (55.6%)	0.547	31 (62.0%)	62 (50.8%)	0.182
Non-Country	18 (50.0%)	59 (44.4%)		19 (38.0%)	60 (49.2%)	
Jazz	20 (55.6%)	74 (55.6%)	0.993	29 (58.0%)	65 (53.3%)	0.572
Non-Jazz	16 (44.4%)	59 (44.4%)		21 (42.0%)	57 (46.7%)	
R&B	20 (55.6%)	86 (64.7%)	0.316	29 (58.0%)	79 (64.8%)	0.405
Non-R&B	16 (44.4%)	47 (35.3%)		21 (42.0%)	43 (35.2%)	
Hip Hop	27 (75.0%)	86 (64.7%)	0.242	32 (64.0%)	81 (66.4%)	0.764
Non-Hip Hop	9 (25.0%)	47 (35.3%)		18 (36.0%)	41 (33.6%)	

Note. Hypothesis 1. This table shows the scores of each music genre compared to those who do not listen to that music genre. It also shows the scores of those who scored high to very high on the NEO-PI-R for Agreeableness and Openness. To have a score of high, one would have to score at least 87 to 106 on Agreeableness and Openness. To have a score of very high, one would have to score 107 to 192. Those who score high on Openness have vivid imaginations, daydream as a way of creating for themselves an interesting world, have a deep appreciation for art and beauty, are moved by poetry, absorbed in music, and intrigued by art. High scorers also experience deeper and more differentiated emotional states and feel both happiness and unhappiness more intensely than others. High scorers on Openness also prefer novelty and variety to familiarity and routine. They are also more prone to consider new and unconventional ideas and more readily re-examine social, political, and religious values. High scores for Agreeableness have a disposition to believe that others are honest and well-intentioned, are generally more altruistic, more humble and self-effacing and are moved by other's needs.

Supplemental Analysis

Of those sampled, 4 participants scored in the average range (65-86). 46 scored in the high range (87-106), 122 scored in the very high range (107-192) on the Openness scale. Only 3 participants scored average (65-86), 33 scored high (87-106), and 133 scored very high (107-192) on the Agreeableness scale. The average and high scores were collapsed since there were so few average scores and Chi-squares were run for each. Techno and Alternative music were significantly correlated with “high” and “very high” on the Openness scale through this method. The Chi Square Table 2 displays this.

Preferred Styles of Music (Hypothesis 1)

T-tests were run to determine the scores of Agreeableness and Openness of music style preferred. The group who preferred rhythm and blues music had significant higher mean association on the Openness scale than other groups who preferred other styles of music ($p=0.028$). Groups who preferred Classical music, Techno music, and Alternative music also had mean scores that associated with Openness at $p=0.001$, but not as high as the group who preferred rhythm and blues music (see Table 3). The group who preferred to listen to country ($p=0.035$) music had negative mean scores on the Openness scale ($p=0.035$). Those who preferred Jazz music did not have any significant association with Agreeableness or Openness as was predicted.

Table 3

Preferred Style of Music
T-Tests

	Agreeableness	P-value	Openness	P-value
Rock	120.48 ± 17.20	0.893	117.43 ± 18.71	0.256
Non-Rock	120.03 ± 16.55		113.48 ± 13.81	
Classical	121.46 ± 16.82	0.302	120.30 ± 19.49	0.001
Non-Classical	118.68 ± 17.33		111.13 ± 13.52	
Techno	121.78 ± 16.70	0.334	122.08 ± 19.95	0.001
Non-Techno	119.23 ± 17.30		111.98 ± 14.46	
Alternative	121.10 ± 17.10	0.472	120.59 ± 18.90	0.001
Non-Alternative	119.13 ± 16.95		109.90 ± 13.73	
Top 40	121.03 ± 17.07	0.358	116.48 ± 16.50	0.781
Non-Top 40	118.11 ± 16.91		117.42 ± 22.70	
Country	121.84 ± 16.75	0.225	114.02 ± 16.95	0.035
Non-Country	118.65 ± 17.30		119.80 ± 18.60	
Jazz	119.95 ± 16.57	0.706	118.71 ± 17.80	0.101
Non-Jazz	120.95 ± 17.67		114.21 ± 17.84	
R&B	121.20 ± 16.20	0.425	118.98 ± 17.08	0.028
Non-R&B	119.03 ± 18.38		112.78 ± 18.73	
Hip Hop	118.74 ± 16.36	0.074	116.93 ± 16.96	0.797
Non-Hip Hop	123.71 ± 17.99		116.19 ± 19.74	

Note. For the hypothesis that those who prefer jazz and R&B would have higher scores on Agreeableness and Openness, there were no participants who chose only one music preference as their favorite. There was no section on the Music Apperception Scale to determine this. This table represents the t-tests that were run to determine directionality of each music style by comparing the means of those who liked or disliked a specific music style.

Because several t-tests were run, Bonferoni Adjustment was used to adjust for Type 1 error and to see if significant scores would remain the same. Using Bonferoni Adjustment, the group who preferred Rhythm and Blues music still had significantly associated scores on the Openness ($p=0.208$). With the Bonferoni Adjustment, the group with a preference for Classical music correlated positively with scores on the Openness scale (0.332). With the Bonferoni Adjustment, the group with a preference for Techno music (0.276) correlated positively with scores on the Openness scale, and the group with a preference for Alternative music (0.358) also correlated positively with scores on the Openness scale. The group who preferred to listen to Country music had lower scores and a negative association on the Openness scale. There were no significant associations with Agreeableness for any preferred music style. However, using the Bonferoni Adjustment, Openness scores were significantly correlated with Jazz ($p=0.201$).

There was no significant correlation for NEO-PI-R score for Agreeableness and any of the Music Apperception Scales (see Table 3 and 4). The hypothesis that there would be significant associations with Agreeableness regarding music styles of Jazz and Rhythm and Blues was not confirmed. The hypothesis that Jazz and Rhythm and Blues music would have higher scores on Openness was not confirmed. It was found that the group that preferred Classical music and Techno music had higher scores on the Openness scale. The group that preferred Jazz and Rhythm and Blues music had significantly higher scores on the Openness scale than the groups that preferred Top 40, Country and Western music, and Hip-Hop/Rap music.

Table 4

Spearman's Rho

Music Genre	Agreeableness	Openness
Jazz	-0.041 (p=0.616)	0.201 (p=0.012)
R&B	0.109 (p=0.183)	0.208 (p=0.009)
Rock	0.063 (p=0.435)	0.190 (p=0.016)
Classical	0.067 (p=0.404)	0.332 (p=0.001)
Techno	0.008 (p=0.920)	0.276 (p=0.001)
Alternative	0.053 (p=0.512)	0.358 (p=0.001)
Top 40	0.012 (p=0.885)	0.066 (p=0.409)
Country Western	0.091 (p=0.259)	-0.130 (p=0.099)
Hip Hop	-0.133 (p=0.099)	0.080 (p=0.320)

Note. With Bonferoni corrections it was found that Jazz, Rhythm and Blues, Rock, Classical, and Techno music were significant for Openness. No musical styles were significantly correlated with Agreeableness.

Multiple Styles of Music Preferred (Hypothesis 2)

Regarding the hypothesis that those who prefer more than one style of music would have a higher score on Openness and Agreeableness, preference for more than one style of music was positively correlated with Openness ($r=0.212$, $p=0.005$). There were no significant correlations between number of styles preferred and Agreeableness ($r=0.056$, $p=0.468$) but there was for Openness ($r=0.212$, $p=0.005$) (see Table 5).

Table 5

Pearson Correlation Using Number of Music Styles Liked as Continuous (n=177)

	Openness (Continuous)	Agreeableness (Continuous)
Number of Music Styles Liked Continuous	$r=0.212$ ($p=0.005$)	$r=0.056$ ($p=0.468$)

Table 3 compares the means of those who liked a specific music style with those who did not like a specific music style to show the direction of preference. Groups who preferred Rhythm and Blues (Soul) had higher association scores for Openness compared to non-Rhythm and Blues listeners. Groups who preferred Classical music had higher scores on Openness compared to non-Classical music listeners. Groups who preferred Techno music had higher Openness scores than non-Techno music listeners, and groups who preferred Alternative music had higher scores on Openness than non-Alternative music listeners. Groups who preferred to listen to Country music had lower scores on Openness than non-Country music listeners. No groups who preferred any of the music

styles scored a significant relationship with Agreeableness. Groups who listened to Country and Western scored a negative correlation, which was a significant negative correlation.

Discussion

The present study investigated the relationship between music preference styles and the personality traits of Openness and Agreeableness. The purpose was to study the degree of Openness and Agreeableness associated with preference for musical style. Past studies used different measuring scales other than the Music Preference Scale to assess for music preference such as the Short Test of Musical Preferences (STOMP) and different scales to test for personality. This study used the Music Preference Scale, as well as the revised personality scale for the Big Five traits (Costa & McCrae, 1992), and the NEO-PI-R. The Music Preference Scale used in this study was updated by incorporating musical artists from the current years of 2000 until the present rather than from the 1970s to the 1980s.

It was found that there were no significant associations of Agreeableness with any music style, but Openness did have significant associations with Rhythm and Blues, Rock, Classical, Techno, and Alternative music.

This lends credence that there are no differences regarding Agreeableness with groups who prefer groups to listen to Jazz, Rhythm and Blues, Rock, Classical, Techno, Alternative, Top 40, Hip-Hop, or Country music. The findings also lend credence that groups who prefer to listen to Rhythm and Blues, Rock, Classical, Techno, and Alternative music are more open to experience than those who listen to Top 40, Hip-Hop, and Country music.

It is of note that the majority of the participants scored high to very high on Agreeableness and Openness scales. According to Costa and McCrae (1992), those who score high on Openness have vivid imaginations, daydream as a way of creating for

themselves an interesting world, have a deep appreciation for art and beauty, are moved by poetry, absorbed in music, and intrigued by art. High scorers also experience deeper and more differentiated emotional states and feel both happiness and unhappiness more intensely than others. High scorers on Openness also prefer novelty and variety to familiarity and routine. They are also more prone to consider new and unconventional ideas and more readily re-examine social, political, and religious values. High scores for Agreeableness have a disposition to believe that others are honest and well-intentioned, are generally more altruistic, more humble and self-effacing and are moved by other's needs.

The hypotheses that those who preferred to listen to Jazz and Rhythm and Blues would have higher scores on Openness and Agreeableness was not found to be true for both personality traits. The present results showed that Agreeableness did not significantly associate with any of the music preferences. There was no significant association with music listeners of any music style with the scores of Agreeableness. Of note, those who preferred Hip-Hop music had a negative correlation regarding Agreeableness. It could be inferred that those who listen to Hip-Hop/Rap music tend to be less agreeable.

However, it was found that Rhythm and Blues preference scores did associate with Openness. Those who preferred Rock, Classical, and Techno music also had significant associations with Openness. Though it was hypothesized that Jazz and Rhythm and Blues listeners would have higher scores of Openness, it was found that a preference for Classical and Techno music had a significant association with the Openness scale more than groups with a preference for Jazz and Rhythm and Blues

music. This lends confirmation to other studies where it was found that Alternative music listeners were perceived as being more open than Metal or Country music listeners (Owens, Herrmann, & Godon, 2006). Groups who preferred Jazz music did have a significant association when Bonferoni Adjustment was used to prevent for Type 1 error, but its strength of association was not as strong as those who preferred Alternative, Classical, Techno, or Rhythm and Blues music.

The finding of preferring Classical music significantly more than other music styles is similar to other studies (Savage, 2006) as well. Classical music was distinctive in that it is associated with the well-educated, which makes sense as the sample for this study was from a university setting. Of note, those who had a preference for Country music correlated negatively with Openness. It could be inferred that those who listen to Country music are less open to experience.

There was no question on the Music Preference Scale that asked to choose “which music genre, if you had to pick only one, do you prefer the most,” to determine if those who prefer Jazz and Rhythm and Blues would have higher Openness and Agreeableness scores. The *t* tests were calculated to determine the means of each music style for Openness and Agreeableness to determine directionality, or what degree of association the mean of a groups preferred music style tended to associate or not associate with regarding Agreeableness or Openness. Alternative and Techno music listeners had significant scores of Openness. This seems consistent with those who listened to Techno music who also go to raves where the population is more open to experience of associating with other lifestyles (gay and straight) as well as drug use (ecstasy).

Regarding the second hypothesis that those who preferred more than one style of music would have a higher degree of Openness and Agreeableness, the number of music styles preferred was not significant for Agreeableness ($r = 0.080$, $p = 0.319$) or Openness ($r = 0.064$, $p = 0.420$) initially. But preferring more than one type of music was associated with Openness ($r=0.212$, $p=0.005$) when cut-off points were used. The cut-off points created were grouped points of liking less than 3 styles of music, preferring 4 to 6 styles of music, and preferring 7 to 9 choices of music. These cut-off points were analyzed using a Pearson analysis. This method was used due to the absence of a “most preferred” question on the questionnaire. The majority of the respondents chose more than one preferred style of music. It was found that the more music styles of music one preferred, the more open to experience they were. This lends to the credence that if one likes more of one style of anything they would be more open-minded to a variety of things, thus be more open to experience in general. If people only preferred one style of music (or one type of fashion or one television show), then it would be fair to assume that they would not be accepting of other elements into their life. It could also be inferred that this confirms that people who are less open have a tendency to be more restrictive in their ability to appreciate a wider variety of music. It could also be inferred that those who are more open have a less restrictive ability to appreciate a wider variety of music and other domains such as politics, religion, lifestyles, and ethnicities. The preset results provide support that music preference can provide information regarding personality. It also provides evidence that Openness to experience is positively related to preference of a variety of different music styles, including styles that are not mainstream such as Techno music and Classical music.

Limitations to the Study

The present study had several limitations:

1. Regarding the Music Apperception Scale, there was no option to choose only one, or one's most preferred style of music. In other words, there was no question that asked to choose "which music genre, if you had to pick only one, do you prefer the most?" The Music Preference Scale should include a final question that asks for one specified music style preferred.

2. The participants of the study were all college students. It is possible that this could have influenced the high scores regarding being Open and Agreeable. Since all participants were college students, they may tend to be more Open and Agreeable to new experiences than the general population. These scores with this population also make it less likely to generalize to the general population/public as well.

3. There were 143 females and only 34 males represented in the study. Separate statistics should be run for males and females. It has been shown in another study (Savage, 2006) that with respect to gender, some musical genres were associated with males (rock, heavy metal). This may account for any significance for hip-hop/rap genre as the majority of our participants were female. However, after careful analysis, rock music was found to be significant for Openness in this study.

4. The majority of participants were Hispanic (72), the second largest majority regarding race was Caucasian (50), and there were only 19 African-American and 13 Asian participants. Though the racial make-up of participants was representative of the area, representation of African-American and Asian groups should be increased when possible.

5. Age may be a limiting factor as the average age of the participants was 25. The population used was exclusively young adults. This makes it difficult to ascertain if the findings could generalize to an older population or the general population.

Future Study

1. Regarding race, future studies should compare the scores between Hispanics with scores between Asian, Caucasian students and African-American students as ones ethnicity may have an impact on the type of music one prefers. To determine any differences in music preference or scores of Openness and Agreeableness within and between race, group differences should be investigated.

2. Future studies on age should be considered as well to see variance comparing age groups. To do this, the study will have cut-off ages similar to cut-off scores reminiscent to how many styles of music liked in this study. This can determine if there is a age profile that associates with specific music styles.

3. Gender differences regarding music preferences and personality traits should also be studied. This can help determine if there are specific preferences of music styles regarding male and females. These findings can aid in future studies that involve music preference and personality in that the factor of gender is accounted for.

4. Future studies using scales to measure music preference should include a question and be specific to qualifying only one music style as the most preferred style of music.

5. Future studies should include the other factors of the NEO-PI-R scale. Specifically, Neuroticism, Extraversion, and Conscientiousness to determine if preferred

music styles associate with these personality traits rather than just Agreeableness and Openness.

6. Study the effects of the finds in this study in specific settings. Specifically, psychological settings. What are the feelings of clients who listen to Classical music in waiting rooms. What would the affects of playing Rhythm and Blues or Techno music in medical and therapeutic waiting rooms have on clients? Would that make clients more open to the therapeutic process?

7. Future studies should also involve research on therapeutic counselors using background music in their practice, specifically Classical, Techno, Rhythm and Blues, and Alternative music and the outcome of therapy.

8. As music is a social phenomena that children and teens are involved with, future studies should also include research that deals with the effects of music on children. Specifically, what styles of music have an affect on a child's personality. Research should also involve research if specific personality traits in children draw them to a specific music style or is they are prone to listen to a certain music style depending on their personality traits.

Conclusion

As the human experience involves engaging in various activities, from listening to music to playing video games, watching television, playing sports, and reading books, this study involved investigating music preferences and how it relates to personality. The present results provide support that music preference can provide information regarding personality. Specifically, certain types of music are significantly correlated with the personality trait of Openness but not the personality trait of Agreeableness. As in

previous studies, (Dollinger, 1993), (Zweigenhaft, 2008), Openness was the most robust personality trait and was correlated with liking less conventional or less mainstream styles of music (Classical and Techno). It is time to ascertain these types of music as mainstream as well as determining through further research if non-traditional music is associated with specific personality traits and behaviors. It was also found that preference of more than one genre of music was significantly correlated with Openness as in the same reported studies (Dollinger, 1993), (Zweigenhaft, 2008).

The significance of these findings are also similar to other studies comparing music preference and personality (Little & Zuckerman, 1986; Rentfrow & Gosling, 2003; Owens, Herrmann, & Gordon, 2006) in that that music preferences provided information about personality that is not readily available through other observable cues, and that highly educated middle-class population are not just predisposed fans of classical music (Savage, 2006) but also of Rhythm and Blues, Techno, and Alternative music.

Although this study showed that Open people preferred Alternative, Classical, Jazz, and Rhythm and Blues, and Techno music, they did not prefer Top 40 (Pop) or Hip-Hop/Rap music. It is of note that in this study, Country music listeners were perceived to be less open to experience, and Hip-Hop/Rap listeners were less agreeable than other music listeners. Further research on Country music listeners should also be conducted. It is reported that Caucasian and Hispanic teens are 1.5 times more likely than African-American teens to regularly tune into to current hits on the radio. African-American teens are also 1.5 times more likely than Hispanic teens and twice as likely as white teens to listen to Hip-Hop/Rap music (Seo, 2002), so given the population, it is expected that Hip-Hop/Rap music would not have been chosen, leading to non-significance. However it

should be noted that if the Seo (2002) demographics are true, inferences could be made for African-American teens regarding being less Agreeable than other races. Further research regarding African-Americans and music preference should be included in personality research.

It is also of note that regardless of music style preferred or how many music styles preferred there was no association with Agreeableness, which suggests that there are limits to one's Agreeableness as well as one's Openness to experience, regardless of what music one prefers.

It was also found that a preference of more than one genre of music was significantly correlated with Openness.

A consideration of the results and findings is how race, age, gender, and music relate to personality patterns. The findings in this study may enhance understanding of personality patterns and how some social aspects of human behavior such as music listening, music preference, and music genres are more likely to reveal personality than other social cues. It can also enhance our ability to use music to help with therapy by including music as part of the therapeutic process by having people bring in their own preferred music to listen to during therapy, having music available and playing in psychological settings such as therapy waiting rooms, and understanding that one's preference for a specific music style could aid therapists in understanding specific personality traits of clients that can aid in determining the likelihood of a client continuing or being open to the therapeutic process.

With this study and others presented in the literature review, music appears to be useful in understanding personality. Daily preferences and their correlation with

personality variables could help target advertising more accurately in that knowing which music style is likely to be associated with being Open to experience. Therapists can not only use music in therapy as previously mentioned, but specific music such as Classical can be used in waiting rooms and as background music in therapy. Of course, this is based on the results of this study and others that found that Classical music was associated with being Open to experience.

This music preference study and music listening habits research can bring awareness to psychology that is typically not used in mainstream research. Combining music with personality as a factor in psychological research may broaden the typical research that uses everyday elements such as music, rather than focusing on what is abnormal or unordinary. Using music and the findings of music preference tied with psychological traits regardless of the findings adds to the information regarding social behaviors. Using music, an everyday element of social behavior, can aid in the research that generalizes to the general public as music is something that is a large part of people lives as well as social behavior. It is hoped that the research findings in this study will aid in understanding the social/psychological aspects of music that is generally ignored by research but is part of everyday life.

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Musical Preference Scale

1. Sex: A = female; B = male.
2. Age:
3. Handedness: A = left; B = right
4. Number of years of formal education your father or mother (whichever is the highest) has completed: A = less than 12 years; B = high school graduate; C = some college; D = college graduate.
5. Number of years of formal education you have completed: A = less than 12 years; B = high school graduate; C = some college; D = college graduate; E = graduate or professional school.
6. What is your primary cultural or racial identification: A = Caucasian; B = Black; C = Hispanic; D = Asian; E = other.
7. Do any you have current hearing deficiencies? A no; B = yes (if yes, please give details on the back of the answer sheet = No. 6).
8. Number of years of music theory classes and/or years of private tutoring in music theory within the past 5 years: A = 0; B = 1; C = 2; D = 3; E = more than 3.
9. Number of years of instrumental or vocal music lessons, either private or group within the past 5 years: A = 0; B = 1; C = 2; D = 3; E = more than 3.
10. Number of years as a musical performer within the past 5 years: A = 0; B = 1; C = 2; D = 3; E = more than 3.
11. Rate your own general level of understanding of music: A = I don't understand anything about music; B = I understand very little about music; C = I understand some aspects of music; D = I understand most aspects of music; E = I understand almost all aspects of music.
12. How important has music been in your life in the past 3 years? A = not at all; B = 1; C = 2; D = 3; E = extremely.
13. On the average, how many hours per day do you actually spend listening to music, either while doing something else or as your main activity? A = 0; B = 1-2; C = 3-4; D = 5-8; E = 9 or more.
14. How much time would you prefer to be able to spend listening to music? A = 0; B = 1-2; C = 3-4; D = 5-8; E = 9 or more.
15. What is your usual level of involvement when you listen to music? A = background only; B = 1; C = 2; D = 3; E = total concentration.
16. How many musical events (concerts, recitals, clubs etc., of all types) have you attended in the past 12 months? A = 0; B = 1-3; C = 4-6; D = 7-9; E = 10 or more.

Instructions: For questions 17-51, please indicate your basic preference level for the following categories of music by using these responses:

A = dislike

B = indifferent, neither like or dislike, or not familiar

C = like slightly

D = like moderately

E = like very much

Note: The artist examples are given solely to help you identify the category, so please rate the category, not the artists.

Rock

17. Rock music in general.
18. Rock and roll (Buddy Holly, Chuck Berry).
19. Classic rock (Jimmy Hendrix, Led Zeppelin, The Who, Rolling Stones).
20. Heavy metal (Pantera, Metallica, Danzig,).
21. Pop rock (Nickelback, Pearl Jam, Green Day, Blink 182).
22. Punk rock (The Clash, Sex Pistols, Fear, Misfits, The Ramones).

Classical

23. Classical music in general.
24. Baroque (Bach).
25. Classical (Mozart, Beethoven).
26. Romantic (Tchaikovsky, Schubert, Schumann).
27. Impressionistic (Debussy).
28. Neoclassical (Stravinsky, Chopin).
29. Contemporary (Bernstein, Ives).

Alternative/Techno

30. Techno music in general (Moby, Basement Jaxx, Chemical Brothers, others).
31. Alternative music in general (R.E.M., The Cure, Nirvana, Nine Inche Nails, The Mars Volta, others).

Jazz

32. Jazz in general.
33. Big band/Swing (Glenn Miller, Duke Ellington).
34. Bebop (Charlie Parker).
35. Progressive jazz (Miles Davis, Herbie Hancock).

Soul/Rhythm and Blues

36. Soul or rhythm and blues in general.
37. Prince.
38. Rhythm and blues (Luther Vandross, Teddy Pendergrass, Stephanie Mills, The Jacksons, Diana Ross).
39. Gospel (Kirk Franklin, The Winans).
40. Modern style (Mary J. Blige, John Legend, Usher, Alicia Keys).
41. Neo-Soul (Maxwell, Usher, Jill Scott, Erica Badu, Bilal, D'Angelo).

Popular

- 42. Top 40 popular music in general.
- 43. Top 40 vocal music (Britney Spears, Justin Timberlake, Gwen Stefani, Christine Aguilera,).

Country and Western

- 44. Country and western music in general.
- 45. Classic country style (Dolly Parton, Johnny Cash, Waylon Jennings, George Jones, Hank Williams Jr).
- 46. Modern country style (Dixie Chicks, Tim McGraw, Alan Jackson, Shania Twain, Trisha Yearwood).
- 47. Country-rock style (The Charlie Daniels Band).
- 48. Gospel style (The Oak Ridge Boys, Alabama, The Statler Bros).

Hip-Hop/Rap

- 49. Hip-Hop/Rap music in general.
- 50. Old School (Run-DMC, Public Enemy, Eric B & Rakim, Boogie Down Productions,).
- 51. Lyrical (Common, The Roots).
- 52. Modern style (Outkast, Jay-Z, Kanye West, The Game).

If you had to choose one of the following components of music as the one which most influences your preferences, which one would it be? A = rhythm; B = melody; C = harmony; D = sound of instruments; E = general loudness level.

Consent Form

Dear Participant,

You are invited to participate in a research study "Personality Related to Music Preference." The purpose of this study is to gain understanding of music and how it may be related to personality traits. This study is part of a supervised doctoral project that is being conducted by Robert Hull, M.A., at Loma Linda University. If you decide to participate, your involvement will take no more than 2 hours of your time. You will be asked to fill out 2 questionnaires concerning music preference and personality. The questions on these inventories pertain to your music preference, emotional, interpersonal, experiential, attitudinal, and motivational styles. Completion of these questionnaires will expose you to minimal risk. There are no foreseeable risks or benefits from your participation since this is assessment study and not a treatment study. Your participation is voluntary and you are free to refuse or stop at any time. Your grades or class standing will not be affected in any way if you decide to stop. All information will be coded by number system and will be confidential. Everything you answer here is completely anonymous and no identifying information will be included on the individual questionnaires you return to us. If there are particular questions you want to skip, you may do so. However, you are encouraged to answer all the questions, as it will be helpful to the study's results. Your identity will not be revealed without expressed written permission. If any duress should arise, or if you have any questions about this project, please do not hesitate to contact me or my research supervisor at the following below. If you would like to obtain a summary of the research findings, you may contact me or my supervisor, Todd Burley, Ph.D. Thank you for your time and cooperation.

Sincerely,

Robert Hull, MA
Psychology Department
Loma Linda University
Phone: 909-924-0891

Todd Burley Ph.D.
Psychology Department
Loma Linda University
Phone: 909-558-8718

Please read the paragraph below, and if you agree to participate, sign below.

I understand that any information about me obtained for this research will be kept confidential. I understand that my research records may be subpoenaed by court order or may be inspected by federal regulatory authorities.

Please place check here to acknowledge you have received a copy of this consent form: _____

Supplemental Tables and Figures

Supplement Table 1

Frequency of Number of Musical Styles Chosen

Number of Music Styles	Frequency	Percent
0	13	7.3
1	3	1.7%
2	1	0.6%
3	9	9.4%
4	24	13.6%
5	22	12.4
6	28	15.8%
7	38	21.5%
8	23	13%
9	16	9%

Note. For example, there were only 3 participants who preferred only one type of musical style. There was only 1 participant who preferred two styles of music.

Supplement Table 2

Alternate Frequency of Number of Musical Styles Chosen

Number of Music Styles	Frequency	Percent
3 or less	26	14.7%
4 to 6	74	41.8%
7 or more	77	43.5%

Note. This table represents the cut off points of music style preferred that was used to determine if the increased number of music style preferred would correlate with having higher scores of Agreeableness or Openness. There were 26 who preferred three or less musical styles, 74 participants who preferred four to six musical styles, and 77 who preferred seven or more musical styles.

Supplemental Table 3

Pearson Correlations

Correlations		
		MusNum
AGREEABLENESS	Pearson Correlation	.056
	Sig. (2-tailed)	.468
	N	169
OPENNESS	Pearson Correlation	.212**
	Sig. (2-tailed)	.005
	N	172

** . Correlation is significant at the 0.01 level (2-tailed).

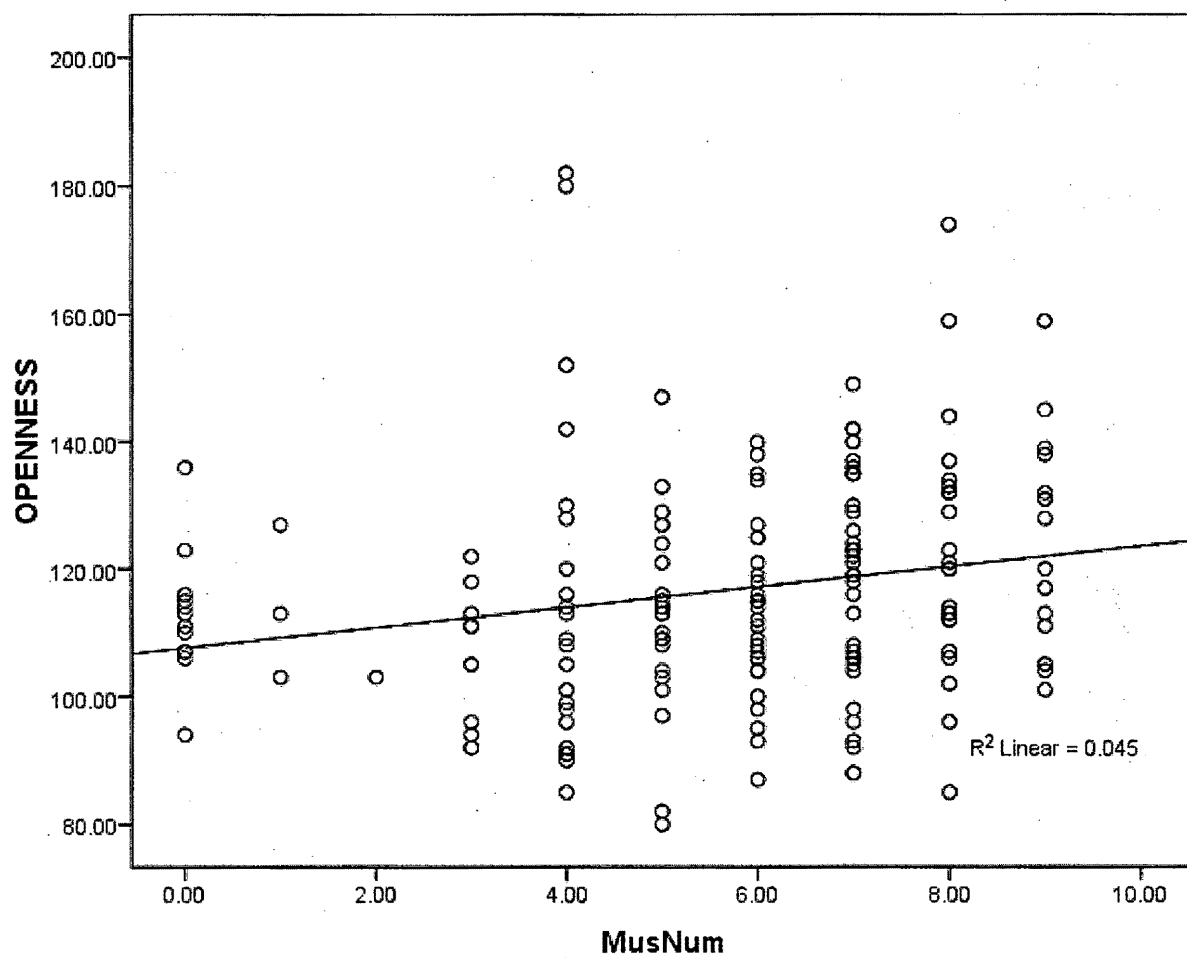


Figure 3. Graph-scatterplot data regarding number of musical styles and score on Openness.

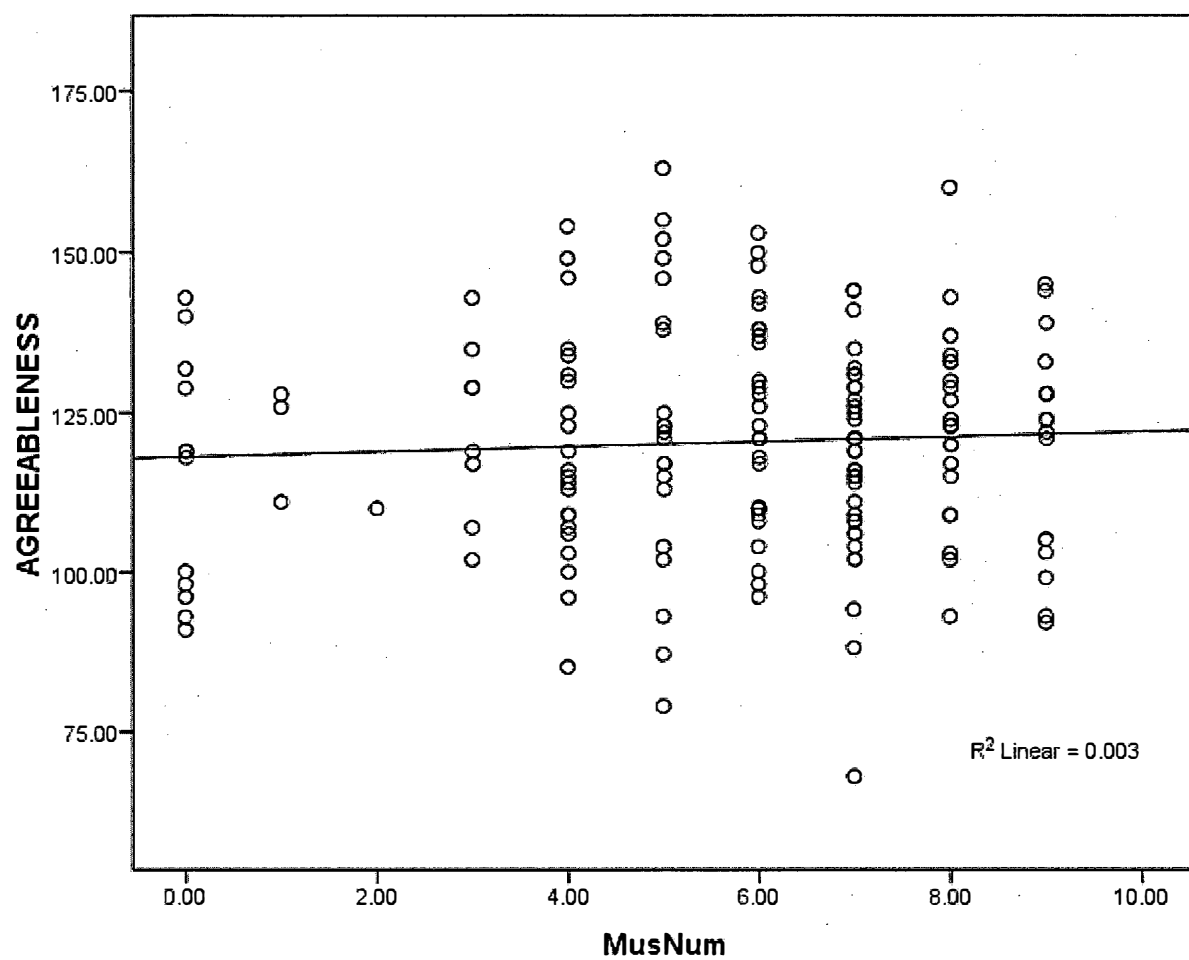


Figure 4. Graph-scatterplot data regarding number of musical styles and score on agreeableness.